

WHAT IS CLAIMED IS:

1. A semiconductor optical modulator having a layered structure in which a semi-insulating type cladding layer,  
5 a semiconductor optical waveguide core layer, and a semi-insulating type cladding layer are sequentially laminated on a substrate, said semiconductor optical modulator characterized in that

a part of at least one of the semi-insulating type  
10 cladding layers including a surface opposite from a laminated surface with the semiconductor optical waveguide core layer is an n-type cladding layer, or all of at least one of the semi-insulating type cladding layers is an n-type cladding layer.

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2. The semiconductor optical modulator according to claim 1, characterized in that a waveguide structure is a high-mesa waveguide structure or a ridge waveguide structure.

20 3. The semiconductor optical modulator according to claim 1, characterized in that electrodes are respectively connected to the n-type cladding layer or the semi-insulating type cladding layer placed directly on the substrate and to the n-type cladding layer or the  
25 semi-insulating type cladding layer including a surface opposite from a laminated surface with the semiconductor optical waveguide core layer laminated on the substrate,

and voltage is applied.

4. The semiconductor optical modulator according to claim  
3, characterized in that the electrode are configured to  
5 be a coplanar waveguide line structure.

5. A semiconductor Mach-Zehnder type optical modulator  
including the semiconductor optical modulator according  
to any one of claims 1 to 4, an optical splitter by which  
10 input light is split into two light beams, and an optical  
coupler by which light beams modulated by the semiconductor  
optical modulator are combined together.

6. A semiconductor optical modulator having a layered  
15 structure in which an n-type cladding layer, an optical  
waveguide core layer, and an n-type cladding layer are  
sequentially laminated on a substrate, said semiconductor  
optical modulator characterized in that

a semi-insulating type cladding layer is laminated  
20 between at least one of the n-type cladding layers and the  
optical waveguide core layer.

7. The semiconductor optical modulator according to claim  
6, characterized in that a waveguide structure is a high-mesa  
25 waveguide structure or a ridge waveguide structure.

8. The semiconductor optical modulator according to claim

6, characterized in that electrodes are respectively connected to the n-type cladding layer or the semi-insulating type cladding layer placed directly on the substrate and to the n-type cladding layer or the  
5 semi-insulating type cladding layer including said opposite surface laminated on the substrate, and voltage is applied.

9. The semiconductor optical modulator according to claim 8, characterized in that the electrode are configured to  
10 be a coplanar waveguide line structure.

10. A semiconductor Mach-Zehnder type optical modulator characterized by including the semiconductor optical modulator according to any one of claims 6 to 9, an optical  
15 splitter by which input light is split into two light beams, and an optical coupler by which light beams modulated by the semiconductor optical modulator are combined together.